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HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 8910
RESTON, VA 20195

| EXAMINER | |
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| SITTA, GRANT | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/727,645 | OGAWA ET AL. | |
| | Examiner | Art Unit | |
| | GRANT D. SITTA | 2629 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *02 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 April 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, **claims 1 and 28** recites the broad recitation “liquid crystal molecules, aligned in **random directions** throughout a liquid crystal panel” (emphasis added), and the claim also recites “each of which has a substantially **fixed twist angle in a direction perpendicular** to substrates sandwiching the liquid crystal layer ” (emphasis added) which is the narrower statement of the range/limitation. For purposes of examination Examiner is going to ignore the term “random”.

3. Regarding claims 35 and 36, the phrase "such that" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

4. Claims 16, 35 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The language “arbitrary position” perpendicular to an extending direction of the scanning lines is indefinite because Examiner notes that the viewer could stand behind the display, and while still being perpendicular to an extending direction of the scanning lines, the viewing angle would not be any wider to the viewer. For purposes of examination Examiner is going to assume that the “arbitrary position” extends only from the front of the device.

5. Claim 8 recites the limitation "the one side" in claim 8 line 5. There is insufficient antecedent basis for this limitation in the claim.

6. Claim 8 recites the limitation "the other side" in claim 8 line 10. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1,2,6,8,10,12,13,21, 28 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagi et (2002/0063669) hereinafter, Yanagi in view of Nomura et al (6,181,310) hereinafter, Nomura.

10. In regards to claim 1, Yanagi discloses the limitations of a liquid crystal display device (fig. 1 (1)), comprising: a plurality of scanning lines (fig. 1 lines from 2); a plurality of signal lines provided so as to cross the scanning signals (fig. 1, lines from 3); pixel capacitors (fig. 21 (12)), respectively formed on pixels corresponding to intersections of the scanning lines and the signal lines (fig. 12 (intersection of G(1) and (S1)), which include pixel electrodes and common electrodes (fig. 12 (intersection of G(1) and (S1),

abstract and [0077]), and correspond to the liquid crystal layer ([0038]); and a common electrode voltage supplying circuit for supplying common electrode voltages to the common electrodes (fig. 1 (5)), said common electrode voltage supplying circuit being capable of adjusting the common electrode voltages fig. 13 (Vcom1 is adjusted)).

Yanagi differs from the claimed invention in that Yanagi does not *explicitly* disclose a liquid crystal layer having liquid crystal molecules, aligned in random directions throughout a liquid crystal panel, each of which has a substantially fixed twist angle in a direction perpendicular to substrates sandwiching the liquid crystal layer.

However Nomura discloses a liquid crystal layer having liquid crystal molecules, aligned in random directions throughout a liquid crystal panel, each of which has a substantially fixed twist angle in a direction perpendicular to substrates sandwiching the liquid crystal layer (fig. 9 and 17 col. 7-8, lines 28-20).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Yanagi to include the use of liquid crystal as taught by Nomura with various states for the liquid crystal molecules in order to provide rapid attenuation of the display state know as frame response as stated in (col. 2, lines 30-54 of Nomura).

11. In regards to claim 28, Yanagi discloses the limitations of a method for driving a liquid crystal display device which includes (fig. 1 (1)): a plurality of scanning lines (fig. 1 lines from 2); a plurality of signal lines provided so as to cross the scanning signals (fig. (fig. 12 (intersection of G(1) and (S1)); pixel capacitors (fig. 21 (capacitors)), having

pixel electrodes and common electrodes (fig. 12 (intersection of G(1) and (S1 and [0077]) and abstract), and corresponding to a liquid crystal layer ([0038]), which are respectively formed on pixels corresponding to intersections of the scanning lines and the signal lines (fig. 12 (intersection of G(1) and (S1)), and method comprising the step of supplying common electrode voltages (fig. 1 (5))adjusting the common electrode voltages (fig. 13 (Vcom1 is adjusted)).

Yanagi differs from the claimed invention in that Yanagi does not *explicitly* disclose the liquid crystal layer has liquid crystal molecules, aligned in random directions throughout a liquid crystal panel, each of which has a substantially fixed twist angle in a direction perpendicular to substrates for sandwiching the liquid crystal layer.

However Nomura discloses the liquid crystal layer has liquid crystal molecules, aligned in random directions throughout a liquid crystal panel, each of which has a substantially fixed twist angle in a direction perpendicular to substrates for sandwiching the liquid crystal layer (fig. 9 and 17 col. 7-8, lines 28-20).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Yanagi to include the use of liquid crystal as taught by Nomura with various states for the liquid crystal molecules in order to provide rapid attenuation of the display state know as frame response as stated in (col. 2, lines 30-54 of Nomura).

12. In regards to claim 2, Yanagi teaches wherein: the common electrodes of the pixels are divided into a plurality of groups (fig. 12 (Vcom 1 and Vcom 2)), and the

common electrode voltage supplying circuit is capable of respectively adjusting the common electrode voltages so that the common electrode voltages are adjusted independently every groups (fig. 13 Vcom1 and Vcom2) [0102] and [0128].

13. In regards to claim 6, Yanagi teaches wherein the common electrodes are grouped for n lines of the scanning lines (n includes one), where n is a positive integer (fig. 12 the scanning lines are at least grouped into one group [0102] and [0128]).

14. In regards to claim 8, Yanagi teaches the liquid crystal display device wherein: the common electrode voltage supplying circuit supplies a common electrode voltage which functions as a reference common electrode voltage to a group *corresponding* to a scanning line positioned on the one side in a direction in which the scanning signals are disposed (fig. 12 Vcom1), and the common electrode voltage supplying circuit supplies a common electrode voltage which has a value different from a value of the reference common electrode voltage to a group corresponding to a scanning line positioned on the other side in the direction in which the scanning signals are disposed (fig. 12 Vcom2).

15. In regards to claim 10, Yanagi teaches the liquid crystal display device as set forth in claim 6, wherein: the common electrode voltage supplying circuit supplies a

common electrode voltage which functions as a reference common electrode voltage to a first group corresponding to a scanning line centered in a direction in which the scanning lines are disposed [0102], and the common electrode voltage supplying circuit supplies a common electrode voltages which is higher than the reference common electrode voltage to a second group corresponding to a scanning line positioned on the one side in the direction in which the scanning lines are disposed [0102-0103], and

Yanagi and Nomura fail to disclose the common electrode voltage supplying circuit supplies a common electrode voltage which is lower than the reference common electrode voltage to **a third group** corresponding to a scanning line positioned on the other side in the direction in which the scanning lines are disposed.

However, under St. Regis Paper Co. v. Bemis Co., Inc. 193 USPQ 8, 11 (7th Cir. 1977) it is generally considered obvious to one of ordinary skill in the art to duplicate parts for multiple effect.

Therefore it would have been obvious to one of ordinary skill in the art to have modified Yanagi and Nomura to include the common electrode voltage supplying circuit supplies a common electrode voltage which is lower than the reference common electrode voltage to **a third group** corresponding to a scanning line positioned on the other side in the direction in which the scanning lines are disposed, when a first and second group are taught above.

16. In regards to claim 12, Yanagi discloses a signal line driving circuit for supplying a display signal voltage to each of the signal lines (fig. 1 (2).

Yanagi fails to disclose wherein the common electrode voltage supplying circuit is provided in the signal line driving circuit.

However, *In re Larson*, 144 USPQ 347 (CCPA) states it is generally it is obvious to one of ordinary skill in the art to make parts integral.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to the common electrode voltage supplying circuit is provided in the signal line driving circuit, since integrating parts can make the size smaller and easier for repair.

17. In regards to claim 13 Yanagi teaches the liquid crystal display device as set forth in claim 6, wherein the common electrode voltage supplying circuit adjusts the common electrode voltages supplied to the groups so that luminance of the pixels gradually varies [0102] so as to be monotonously darker or so as to be monotonously brighter from one end side to a center of the scanning lines in a direction in which the scanning lines are disposed ([0038] “An objective of the invention is to offer an active matrix liquid crystal display and a method of driving the display which allows for reducing the aforementioned difference in brightness that occurs between the top and bottom of the display screen” Yanagi). Examiner notes that Yanagi teaches adjusting

the luminance [0102] and that such adjustments must be either monotonously darker or monotonously brighter.

18. In regards to claim 21, Yanagi teaches the liquid crystal display device as set forth in claim 1, comprising: a scanning line driving circuit (fig. 1 (2)) for driving the scanning lines (fig. 1 G(1), G(2)-(G(J)); and a reference voltage generating circuit for generating reference voltages (fig. 2 (4)), having plural levels different from each other (fig. 2 (4) Vsp and Vsn)), which are supplied to the scanning line driving circuit so as to make gradation display in accordance with a display signal [0080-0082], said reference voltage generating circuit being capable of adjusting the reference voltages [0080].

19. In regards to claim 35. Yanagi teaches the liquid crystal display device as set forth in claim 2, wherein the common electrode voltage supplying circuit adjusts the common electrode voltages to correct luminance and color variation of the pixels such that a visual angle with respect to the liquid crystal panel, viewed at least from an arbitrary position in a direction perpendicular to an extending direction of the scanning lines, is wider than a visual angle if the common electrode voltages of all the groups are equal to each other ([0102] Yanagi). Examiner notes that it is inherent that uniform brightness and improved image quality will increase the viewing angle.

20. Claims 3-5, 7, 9, 11, 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagi and Nomura, and further in view of Tomita et al (5,686,932) hereinafter, Tomita.

21. In regards to claim 3, Yanagi and Nomura differs from the claimed invention in that Yanagi and Nomura do not explicitly disclose at least first pixel capacitors and second pixel capacitors are provided on each of the pixels as the pixel capacitors

However, Tomita teaches a system and method for at least first pixel capacitors and second pixel capacitors are provided on each of the pixels as the pixel capacitors (fig. 1 Clc and Cs).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Yanagi to include the use of at least first pixel capacitors and second pixel capacitors are provided on each of the pixels as the pixel capacitors as taught by Tomita in order to provide a LCD display with a stable high quality image without defects of flicker or non-uniformity (col. 2, lines 50-65 of Tomita).

Therefore, Yanagi and Nomura as modified by Tomita teach wherein the common electrode voltage supplying circuit is capable of respectively independently (fig. 13 Vcom1 and Vcom2 Yanagi) adjusting a common electrode voltage (fig. 12 Vcom1 and Vcom2 Yanagi) supplied to common electrodes [0128 Yanagi] corresponding to the first pixel capacitors (fig. 1 (CLc) Tomita) and common electrode voltages supplied to common electrodes corresponding to the second pixel capacitors (fig. 1 (Cs) Tomita).

22. In regards to claim 4, Yanagi and Nomura as modified by Tomita teaches the liquid crystal display device wherein: the common electrodes corresponding to the second pixel capacitors (fig. 1 (Cs) Tomita) are divided into a plurality of groups (fig. 12 Vcom1 and Vcom 2 Yanagi), and the common electrode voltage supplying circuit supplies the common electrode voltage at a same value to the common electrodes corresponding to the first pixel capacitors (fig. 1 Clc Tomita) , and is capable of respectively adjusting the common electrode voltages supplied to the common electrodes corresponding to the second pixel capacitors independently every groups (fig. 12 Vcom1 and Vcom2 and fig. 13 Yanagi).

23. In regards to claim 5, Yanagi and Nomura as modified by Tomita teaches wherein: the common electrodes corresponding to the first pixel capacitors are divided into a plurality of groups (fig. 1 (group corresponding to 107 Tomita), and the common electrode corresponding to the second pixel capacitors are divided into a plurality of groups (fig. 1 group corresponding to 109 Tomita), and the common electrode voltage supplying circuit is capable of respectively adjusting the common electrode voltage supplied to the common electrodes corresponding to the first pixel capacitor independently every groups (fig. 13 Vcom 1 and Vcom 2 Yanagi) and is capable of respectively adjusting the common electrode voltages supplied to the common

electrodes corresponding to the second pixel capacitors independently ever groups (fig. 13 Vcom 1 and Vcom 2 Yanagi).

24. In regards to claim 7, Yanagi and Nomura as modified by Okada teaches wherein the common electrodes are grouped for n lines of the scanning lines (n includes one), where n is a positive integer (fig. 12 G(1), G(2) and G(3) Yanagi).

25. In regards to claim 9, Yanagi and Nomura as modified by Tomita teaches the liquid crystal display device as set forth in claim 7, wherein: the common electrode voltage supplying circuit supplies a common electrode voltage which functions as a reference common electrode voltage to a group corresponding to a scanning line positioned on the one side in a direction in which the scanning signals are disposed (fig. 12 Vcom1 Yanagi), and the common electrode voltage supplying circuit supplies a common electrode voltage which has a value different from a value of the reference common electrode voltage to a group corresponding to a scanning line positioned on the other side in the direction in which the scanning signals are disposed (fig. 12 Vcom2 Yanagi).

26. In regards to claim 11 Yanagi and Nomura as modified by Tomita teaches the liquid crystal display device wherein: the common electrode voltage supplying circuit

supplies a common electrode voltage which functions as a reference common electrode voltage to a first group (fig. 1 group corresponding to 107) corresponding to a scanning line centered in a direction in which the scanning lines are disposed (fig. 12 Vcom1 Yanagi), and the common electrode voltage supplying circuit supplies a common electrode voltages which is higher than the reference common electrode voltage to a second group (fig. 13 Vcom1 and Vcom2 voltage Yanagi) corresponding to a scanning line positioned on the one side in the direction in which the scanning lines are disposed (fig. 12 Vcom2),

Yanagi and Nomura as modified by Tomita differ in that they don't disclose using a third group.

However, under St. Regis Paper Co. v. Bemis Co., Inc. 193 USPQ 8, 11 (7th Cir. 1977) it is generally considered obvious to one of ordinary skill in the art to duplicate parts for multiple effect.

Therefore it would have been obvious to one of ordinary skill in the art to have modified Yanagi, Nomura and Tomita to include the common electrode voltage supplying circuit supplies a common electrode voltage which is lower than the reference common electrode voltage to a third group corresponding to a scanning line positioned on the other side in the direction in which the scanning lines are disposed, when a first and second group are taught above.

27. In regards to claim 14, Yanagi and Nomura as modified by Tomita teaches the liquid crystal display device as set forth in claim 7, wherein the common electrode voltage supplying circuit adjusts the common electrode voltages supplied to the groups so that luminance of the pixels gradually varies so as to be monotonously darker or so as to be monotonously brighter from one end side to a center of the scanning lines in a direction in which the scanning lines are disposed ([0038] "An objective of the invention is to offer an active matrix liquid crystal display and a method of driving the display which allows for reducing the aforementioned difference in brightness that occurs between the top and bottom of the display screen" Yanagi). Examiner notes that Yanagi teaches adjusting the luminance [0102] and that such adjustments must be either monotonously darker or monotonously brighter

28. In regards to claim 16, Yanagi and Nomura as modified by Tomita teaches the liquid crystal display device as set forth in claim 2, wherein the common electrode voltage supplying circuit adjusts the common electrode voltages so that luminance and color variation of the pixels are corrected so that a visual angle with respect to a liquid crystal panel, viewed from an arbitrary position, is wider than a visual angle in a case where the common electrode voltages of all the groups are equal to each other ([0038] "An objective of the invention is to offer an active matrix liquid crystal display and a method of driving the display which allows for reducing the aforementioned difference in brightness that occurs between the top and bottom of the display screen" Yanagi).

Examiner notes that with corrected luminance as taught by Yanagi the viewing angle will increase.

29. In regards to claim 17, Yanagi and Nomura as modified by Tomita teaches the liquid crystal display device as set forth in claim 16, wherein the common electrode voltage supplying circuit adjusts the common electrode voltages so that luminance and color variation of the pixels are corrected so that a visual angle with respect to a liquid crystal panel, seen from an arbitrary position in an up-and-down direction, is wider than a visual angle in a case where the common electrode voltages of all the groups are equal to each other. ([0038] “An objective of the invention is to offer an active matrix liquid crystal display and a method of driving the display which allows for reducing the aforementioned difference in brightness that occurs between the top and bottom of the display screen” Yanagi). Examiner notes that with corrected luminance as taught by Yanagi the viewing angle will also increase in the up and down direction because a screen that does not have proper luminance also does not have proper contrast both of which determine viewing angle.

30. In regards to claim 18, Yanagi and Nomura as modified by Tomita teaches the liquid crystal display device as set forth in claim 4, wherein the common electrode voltage supplying circuit adjusts the common electrode voltages so that luminance and color variation of the pixels are corrected so that a visual angle with respect to a liquid

crystal panel, seen from an arbitrary position, is wider than a visual angle in a case where the common electrode voltages of all the groups are equal to each other. ([0038] "An objective of the invention is to offer an active matrix liquid crystal display and a method of driving the display which allows for reducing the aforementioned difference in brightness that occurs between the top and bottom of the display screen" Yanagi).

31. In regards to claim 19, Yanagi and Nomura as modified by Tomita the liquid crystal display device as set forth in claim 18, wherein the common electrode voltage supplying circuit adjusts the common electrode voltages so that luminance and color variation of the pixels are corrected so that a visual angle with respect to a liquid crystal panel, seen from an arbitrary position in an up-and-down direction, is wider than a visual angle in a case where the common electrode voltages of all the groups are equal to each other. ([0038] "An objective of the invention is to offer an active matrix liquid crystal display and a method of driving the display which allows for reducing the aforementioned difference in brightness that occurs between the top and bottom of the display screen" Yanagi). Examiner notes that with corrected luminance as taught by Yanagi the viewing angle will also increase in the up and down direction because a screen that does not have proper luminance also does not have proper contrast both of which determine viewing angle.

32. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagi and Nomura as modified by Tomita, in view of Nakao et. al (US 20010003431) hereinafter, Nakao.

33. In regards to claim 20, Yanagi and Nomura as modified by Tomita differ from the claimed invention in that Yanagi and Nomura as modified by Tomita do not disclose wherein the common voltage supplying circuit includes: an input terminal for receiving a voltage which functions as a standard voltage of the common electrode voltages; a resistance element whose one end is connected to the input terminal; a constant current source for causing a constant current to flow to the resistance element; an output terminal, connected to other end of the resistance element, which outputs an output voltage; and a data latch circuit for outputting adjustment data, in accordance with which (i) a current value of the constant current caused to flow by the constant current source and (ii) a direction in which the constant current caused to flow are switched, to the constant current source.

However, Nakao teaches a system and method for wherein the common voltage supplying circuit includes: an input terminal for receiving a voltage which functions as a standard voltage of the common electrode voltages; a resistance element whose one end is connected to the input terminal; a constant current source for causing a constant current to flow to the resistance element; an output terminal [0067-0072], connected to other end of the resistance element, which outputs an output voltage; and a data latch circuit for outputting adjustment data, in accordance with which (i) a current value of the

constant current caused to flow by the constant current source (fig. 4 (43) and (ii) a direction in which the constant current caused to flow are switched (fig. 4 (42)), to the constant current source
(fig. 2 (42)).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Yanagi, Nomura and Tomita to include the use of a common voltage supplying circuit as taught by Nakao in order to generate a reference voltage at each level of basis of a voltage supplied from an external reference voltage generating circuit as stated in ([0013] of Nakao).

34. Claims 22-27, 29, 33, 34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanagi and Nomura in view of Nakao et. al (US 20010003431) hereinafter, Nakao.

35. In regards to claim 22, Yanagi and Nomura discloses the limitations of a reference voltage generating circuit adjusts the reference voltages (fig. 2 (4) Vsp Vsn Yanagi) of which is constituted of the pixels provided in a direction in which the scanning lines are disposed (fig. 1 G(1) G(2) – G(J) Yanagi).

Yanagi and Nomura differ from the claimed invention in that Yanagi and Nomura do not explicitly disclose reference voltages so that a predetermined gamma characteristic is obtained in an arbitrary line of lines.

However, Nakao teaches a system and method for reference voltages so that a predetermined gamma characteristic is obtained in an arbitrary line of lines (fig. 10 (39) [0013-0014]).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Yanagi and Nomura to include the use of reference voltage which provides gamma characteristics as taught by Nakao in order to provide proper gray levels as stated in ([0013] of Nakao).

36. In regards to claim 23, Yanagi and Nomura differ from the claimed invention in that Yanagi and Nomura do not disclose a correction information storage circuit for storing adjustment amounts of the reference voltages, wherein the reference voltage generating circuit adjusts the reference voltages in accordance with the adjustment amounts stored in the correction information storage circuit.

However, Nakao teaches a system and method for comprising a correction information storage circuit for storing adjustment amounts of the reference voltages, wherein the reference voltage generating circuit adjusts the reference voltages in accordance with the adjustment amounts stored in the correction information storage circuit. ((fig. 1 (43) [0065-0067] of Nakao).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Yanagi and Nomura to include the use of storing adjustment amounts as taught by Nakao in order to be used by the gamma correction adjustment circuit during fine adjustments as stated in ([0065] of Nakao).

37. In regards to claim 24, Yanagi and Nomura as modified by Nakao teaches the liquid crystal display device as set forth in claim 22, wherein the reference voltage generating circuit adjusts the reference voltages so that a gamma characteristic is obtained in a line (fig. 5 gamma adjustment of Nakao), constituted of the pixels, which is positioned on the one side in a direction in which the scanning lines are disposed and another gamma characteristic is obtained in a line, constituted of the pixels, which is positioned on the other side in the direction in which the scanning lines are disposed, said gamma characteristics being different from each other (fig. 12 (Vcom1 Vcom2 Yanagi).

38. In regards to claim 25, Yanagi and Nomura as modified by Nakao teaches the liquid crystal display device as set forth in claim 22, wherein the reference voltage generating circuit adjusts the reference voltages so as to obtain gamma characteristics different (fig. 5 gamma adjustment of Nakao) from each other in a first line constituted of the pixels provided on the one side in a direction in which the scanning lines are disposed , a second line constituted of the pixels provided on the other side in the direction in which the scanning lines are disposed (fig. 12 (Vcom1 Vcom2)) , and a third line (fig. 5 third line Nakao) constituted of the pixels provided between the first line and the second line so that the gamma characteristic obtained in the third line is

intermediate between the gamma characteristic obtained in the first line and the gamma characteristic obtained in the second line (fig. 5 third line Nakao).

39. In regards to claim 26, Yanagi and Nomura as modified by Nakao teaches the liquid crystal display device as set forth in claim 21, wherein: the reference voltage generating circuit (fig. 1 (4) Yanagi) adjusts the reference voltages so as to obtain a gamma characteristic (fig. 5 Nakao gamma correction) which causes luminance to decrease in a numerical order of the scanning lines (fig. 7 top and bottom rows Yanagi) in a case of using a liquid crystal panel whose luminance increases while a view point is moving from an upper direction to a lower direction with respect to the liquid crystal panel when an observer faces the liquid crystal panel ([0103] Yanagi), and the reference voltage generating circuit (fig. 1 (4) Yanagi) adjusts the reference voltages so as to obtain a gamma characteristic (fig. 5 Nakao gamma correction) which causes the luminance to increase in a numerical order of the scanning lines (fig. 7 top and bottom rows Yanagi) in a case of a liquid crystal panel whose luminance decreases while the view point is moving from the upper direction to the lower direction with respect to the liquid crystal panel when the observer faces the liquid crystal panel ([0103-0104] Yanagi).

40. In regards to claim 27, Yanagi and Nomura as modified by Nakao teaches the liquid crystal display device as set forth in claim 26, wherein: the common electrode

voltage supplying circuit adjusts the common electrode voltages so that the luminance decreases in the numerical ("Further, the common signal Vcom is specified to change in polarity in the latter half of the non-scan period; reproduction of the original brightness is thereby ensured to a satisfactory degree. Especially, if the polarity change occurs immediately before the end of the non-scan period, reproduction of the original brightness is almost fully ensured. This further improves the display quality of the liquid crystal display." [0039]) order of the scanning lines in the case of using the liquid crystal panel whose luminance increases while the view point is moving from the upper direction to the lower direction (fig. 7 top and bottom rows Yanagi) with respect to the liquid crystal panel when the observer faces the liquid crystal panel, and the common electrode voltage supplying circuit adjusts the common electrode voltages so that the luminance increases in the numerical order of the scanning lines in the case of using the liquid crystal panel whose luminance decreases while the view point is moving from the upper direction to the lower direction with respect to the liquid crystal panel when the observer faces the liquid crystal panel ([0102-0103] Yanagi).

41. In regards to claim 29, Yanagi and Nomura as modified by Nakao teaches the method as set forth in claim 28, wherein the common electrodes of the pixels are divided into a plurality of groups, and the common electrode voltages are respectively adjusted so as to be adjusted independently every groups fig. 12 Vcom1 and Vcom 2 and G(1) G(2) and G(3) Yanagi).

42. In regards to claim 30, Yanagi and Nomura as modified by Nakao teaches the method as set forth in claim 28, comprising the step of generating reference voltages (fig. 1 (4) Yanagi), having plural levels, which cause gradation display to be made in accordance with a display signal, and adjusting the reference voltages ([0019] Nakao).

43. In regards to claim 31, Yanagi and Nomura as modified by Nakao the method as set forth in claim 30, wherein the reference voltages (fig. 1 (4) Yanagi) are adjusted so that a predetermined gamma characteristic is obtained in an arbitrary line ([0019] Nakao) of lines each of which is constituted of the pixels provided in a direction in which the scanning lines are disposed (fig. 7 top to bottom Yanagi).

44. In regards to claim 32 Yanagi and Nomura as modified by Nakao teaches The method as set forth in claim 29, wherein the common electrode voltages are adjusted so that luminance and color variation of the pixels are corrected so that a visual angle with respect to a liquid crystal panel, viewed from an arbitrary position, is wider than a visual angle in a case where the common electrode voltages of all the groups are equal to each other ([0102] Yanagi).

45. In regards to claim 33, Yanagi and Nomura as modified by Nakao teaches the method as set forth in claim 32, wherein the common electrode voltages are adjusted so that luminance and color variation of the pixels are corrected so that a visual angle with respect to a liquid crystal panel, viewed from an arbitrary position in an up-and-down direction, is wider than a visual angle in a case where the common electrode voltages of all the groups are equal to each other ([0102] Yanagi).

46. In regard to claim 34, Yanagi and Nomura as modified by Nakao teaches the method as set forth in claim 33, wherein the common electrodes in each of the pixels are sequentially grouped for n lines of the scanning lines (n includes one), where n is a positive integer (fig. 12 the scanning lines are at least grouped into one group).

47. In regards to claim 36, (New) Yanagi and Nomura as modified by Nakao teaches the method as set forth in claim 29, wherein the adjusting the common electrode voltages adjusts the common electrode voltages to correct luminance and color variation of the pixels such that a visual angle with respect to the liquid crystal panel, viewed at least from an arbitrary position in a direction perpendicular to an extending direction of the scanning lines, is wider than a visual angle if the common electrode voltages of all the groups are equal to each other ([0102] Yanagi).

### *Response to Arguments*

48. Applicant's arguments, see Remarks, filed 4/02/2008, with respect to the rejection(s) of claim(s) 1-35 under Nakao have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Yanagi.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GRANT D. SITTA whose telephone number is (571)270-1542. The examiner can normally be reached on M-F 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on 571-272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/GDS/
August 3, 2008

/Amare Mengistu/
Supervisory Patent Examiner, Art Unit 2629